

I CLAIM:

1. A method providing a gas turbine compressor impeller, the method comprising the steps of:
 - a. forging IMI834 titanium to provide a blank having a back face;
 - b. forging a stump portion on the blank, the stump portion extending from the back face;
 - c. providing a metal alloy stub shaft; and
 - d. friction welding the stub shaft to the stump portion to provide a welded assembly.
2. The method of claim 1 further comprising the step of providing a billet for use in said forging steps, the billet having a diameter substantially the same as a diameter of said stump portion.
3. The method of claim 1 wherein the stump portion has a height measured from the back face to a stump portion end face, and wherein the height is selected to optimize the mechanical work done on the body while minimizing extrusion in the region of the stump portion to thereby provide improved mechanical properties to the body.
4. The method of claim 1 wherein the stump portion has a diameter and a height, the height measured from the back face to a stump portion end face, and wherein the height is not greater than the diameter.
5. The method of claim 1 wherein the stump portion has a stump height measured from the back face to a stump portion end face, and wherein the method further comprises the step of determining a clearance height required to provide adequate clearance between the stump height and the back face for accomplishing a weld flash removal step, and wherein the stump portion is forged to have a stump height substantially equal to the clearance height.

6. The method of claim 1 further comprising the steps of heat treating the welded assembly and then de-flashing a weld portion of the welded assembly.
7. The method of claim 1 wherein the metal alloy is IMI834.
8. A method for making an impeller rotor for a gas turbine engine, the method comprising the steps of:
 - a. forging a blank from IMI834 titanium alloy;
 - b. providing a metal alloy component;
 - c. friction welding the component to the blank to provide a welded assembly;
 - d. heat treating the welded assembly to at least relieve a weld zone; and then
 - e. removing weld flashing from the weld zone.
9. The method of claim 8 wherein the step of forging includes a step of forging a stump portion on the blank, and wherein the component is friction welded to the stump.